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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/779,707

02/18/2004

Michael Redecker

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10/19/2006

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EXAMINER

CANNING, ANTHONY J

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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| | | | |
|------------------------------|---------------------------------------|--|--|
| Office Action Summary | Application No. 10/779,707 | Applicant(s) REDECKER ET AL. | |
| | Examiner Anthony J. Canning | Art Unit 2879 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>2/04, 6/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of the restriction in the reply filed on 2 August is acknowledged. The traversal is on the ground(s) that there the method claim would be encompassed in the search for the device. This is not found persuasive because the re-emissive mode to suppress photoluminescent emission is not necessarily disclosed in the product claims.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

Claim 11 is objected to because of the following informalities: claim 11 depends from claim 6, but is a duplicate claim of claim 6. Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims 6, 19 and 23 recites the limitation "wide-band gap organic semiconductor" in line 1, respectively. There is insufficient antecedent basis for this limitation in the claim.

The examiner assumes that the wide-band gap organic semiconductor is referring to one of the electrodes.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Thompson et al. (WO 03/022008 A1).

As to claims 1 and 13, Thompson et al. discloses a display based on a photoluminescence quenching device (PQD), the display comprising: a substrate (page 13, line 9); an organic emitter layer (page 9, lines 4-6); a first electrode layer (page 13, lines 10-11), which is transparent and is arranged on a front side of the emitter layer (page 3, lines 1-4); a second electrode layer (page 3, lines 3-4), which is disposed on the backside of the emitter layer (page 3, lines 1-3); and at least one of a hole barrier layer or an electron barrier layer (page 16, line 15) where the hole barrier layer and/or the electron barrier layer are disposed between the emitter layer and one of the first electrode layer and second electrode layer (page 13, lines 19-22), wherein a highest occupied molecule orbital of the hole barrier layer is energetically lower than a highest occupied molecule orbital of the emitter layer (page 13, lines 22-23), and/or a lowest unoccupied molecule orbital of the electron barrier layer is energetically higher than a lowest unoccupied molecule orbital of the emitter layer (page 17, lines 17-30).

As to claims 2 and 14, Thompson et al. discloses the display of claims 1 and 13. Thompson et al. further disclose that the lowest unoccupied molecule orbital of the emitter layer

corresponds to the lowest unoccupied molecule orbital of the hole barrier layer and/or the highest occupied molecule orbital of the electron barrier layer corresponds to the highest occupied molecule orbital of the emitter layer (page 18, lines 28-30; the examiner interprets “close” to mean corresponding to the lowest or lowest unoccupied molecular orbital, depending on the exciton HOMO or LUMO energy level), whereby the first electrode layer forms a cathode and the second electrode layer forms an anode during re-emissive operation of the display, and the first electrode layer forms the anode and the second electrode layer forms a cathode during emissive operation of the display (page 13, lines 9-11).

As to claims 3, 8, 16 and 20, Thompson et al. discloses the display of claims 1, 2, 13 and 14. Thompson et al. further disclose that an energy difference between the highest occupied molecule orbital of the electron barrier layer and the lowest unoccupied molecule orbital of the electron barrier layer and an energy difference between the highest occupied molecule orbital of the hole barrier layer and the lowest unoccupied molecule orbital of the hole barrier layer each amount to at least about 3.3 eV (page 19, lines 15-19).

As to claims 4, 9, 17 and 21, Thompson et al. discloses the display of claims 1, 2, 13 and 14. Thompson et al. further disclose that the electron barrier layer comprises at least one compound selected from a group consisting of triphenylamine derivatives, benzidine derivatives, and phenylenediamine derivatives (page 23, the metal doped organic structure at the bottom of the page).

As to claims 5, 10, 18 and 22, Thompson et al. discloses the display of claims 1, 2, 13 and 14. Thompson et al. further disclose that the hole barrier layer comprises at least one compound selected from a group consisting of oxadiazole derivatives, oxazole derivatives,

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triazole derivatives and quinoxaline derivatives and/or at least one compound selected from a group consisting of naphthalene carboxylic acid imide derivatives, naphthalene dicarboxylic acid dimide derivatives and wide-bandgap inorganic semiconductors (page 19, lines 15-28).

As to claims 6, 11, 19 and 23, Thompson et al. discloses the display of claims 5, 18 and 22. Thompson et al. further disclose that the wide-bandgap organic semiconductor is at least one of tin oxide, titanium oxide, zinc oxide, zirconium oxide, tantalum oxide, zinc sulphide and zinc selenide (page 3, lines 1-3).

As to claims 7 and 15, Thompson et al. discloses the display of claims 1 and 13. Thompson et al. further disclose that the lowest unoccupied molecule orbital of the emitter layer is energetically higher than the lowest unoccupied molecule orbital of the hole barrier layer and/or the highest occupied molecule orbital of the electron barrier layer is energetically higher than the highest occupied molecule orbital of the emitter layer (page 18, lines 19-30 and page 19, lines 1-5; the range given will yield a higher unoccupied molecular orbital of the emitter layer when looking at the hole barrier layer), whereby the first electrode layer forms a cathode and the second electrode layer forms an anode during re-emissive operation of the display (page 13, lines 9-11).

As to claim 12, Thompson et al. discloses the display of claim 1. Thompson et al. further disclose that the hole barrier layer is disposed on a side of the emitter layer that faces towards the substrate and the electron barrier layer is disposed on a side of the emitter layer that faces away from the substrate (page 13, lines 10-11, with this configuration the hole blocking layer will be on the substrate side).

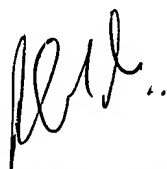
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony J. Canning whose telephone number is (571)-272-2486. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh D. Patel can be reached on (571)-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony Canning
12 October 2006



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